

Space Weather Forecast

Issued on Wednesday, 16 August 2023 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Slight Chance of G1/Minor Geomagnetic Storm conditions on Day 1 and 2 (16th and 17th). Chance of R1/Minor Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with the peak flare a mid-level Common-class flare from the region near the northwestern horizon at 15/0657UTC.

There are now ten sunspot regions on the Earth-facing side of the Sun, with most being small and/or magnetically simple. The most notable sunspot appears to be the region approaching centre disc in the northern hemisphere with the numerous small spots now consolidated into larger lead and trailer spots. Some intermediate spots remain with ongoing spreading and areal growth. A region in the far northeast with a history of high end Common-class flares appears to contain a fairly simple magnetic configuration despite its moderate size, with no apparent change in appearance since the previous assessment. A new region in the southeast has grown rapidly. It remains rather simple magnetically at present, but remains an area of interest, especially if current development trends continue.

A number of Coronal Mass Ejections (CMEs) have been noted on available solar imagery in the past 24 hours, however almost all appear to be on the limb or far-sided events. Late in the period a filament (containing the sun's plasma and magnetic field) lifted off from a region around S22E12 at 15/2200 UTC, however, there is insufficient solar imagery at present to determine if an Earth-directed CME has occurred. As a result no Earth-bound CMEs feature during the period.

Solar Wind / Geomagnetic Activity: The solar wind was characterized by an ongoing slow solar wind regime, but with some late-period signals that a fast wind may be imminent. The solar wind speed showed a falling trend within Background, while their magnetic field was similarly subdued at Weak levels. The important north-south component of the field varied weakly for much of the period, but became mainly anti-aligned (but still weak in magnitude) from around 15/1415 UTC.

The net result of the above solar wind parameters was for Quiet (Kp 0-2) geomagnetic indices throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is currently Low. There is a daily Chance of activity rising to Moderate levels with isolated Moderate-class flares. Western solar horizon departures are expected to be roughly compensated for by eastern arriving groups, giving an estimated flat trend on significant flare probabilities.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently in the

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forecast. There are up to two fast wind streams due in the period. The first will be the more potent if it manifests on Day 1 (16th), and then the second is perhaps most likely on Day 2 (17th). Initially Quiet geomagnetic conditions should become occasionally Unsettled to Active with a Slight Chance of isolated G1/Minor Storm intervals on Day 1 and 2, but reducing later in the period to likely leave more reliably Quiet conditions.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	15	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	35	35	35	35
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						